Installation manual

BB LEDlightpipe EVO

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Table of contents:

1.0 Introduction	3
2.0 Lay out LEDlightpipe EVO	4,5
3.0 LEDlightpipe EVO types	6
4.0 Lighttube configurations	7
5.0 Driver-configurations and specifications	8
6.0 E box plug&play	9
7.0 E box standard	10
8.0 Product numbers	11
9.0 EVO system modules	11
10.0 EVO delivery program	12,13,14
11.0 Mounting the LEDlightpipe to the ceiling	15
12.0 Park Assist module	16
13.0 Special mountings	17
14.0 Line modules	18,19
15.0 Mounting and connecting a line	20
16.0 Phase selection	21
17.0 Inrush current	21
18.0 do's and dont's	22
19.0 certificaten	23

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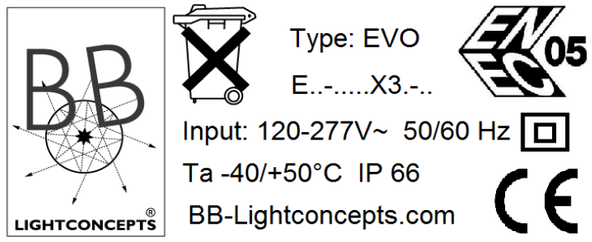
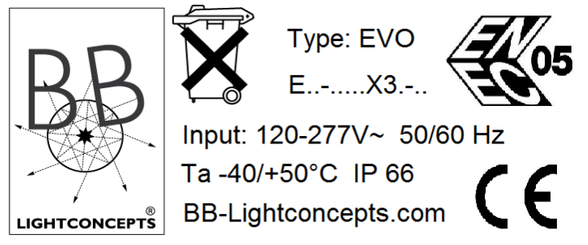
1.0 Introduction

The LEDlightpipe EVO succeeds the BB LEDlightpipe System and Hybrid series. All the benefits of the two previous series have been combined into the LEDlightpipe EVO. Due to thermal optimisation higher LEDcurrents, without compromising the lifetime expectancy, are admissible. The glare free light emission, due to the unique foil technology inside the tubes, is maintained.
Due to the modularity of the system a great number of different luminaires, lengths from 2,3 meters up to 16 meters and luminous output up to 12.450 Lumens, are available. All BB LEDlightpipes are DALI controlled and can be dimmed.
For fast connectivity and line-lighting the plug & play version (multiple tubes) is most suitable.This plug & play version contains accessories like start- and connection cables and quick phase selecting.
The symbols in this manual are also used in our .dwg project drawings.
The LEDlightpipe EVO can be equipped with the Park Assist guidance module.

Input voltage	V ac	120-270
Frequency	Hz	50/60
Rated Power	Watt	see table 1
Dimming signal	--	DALI
Dimming range	--	see table 1
Shock resistance	--	IK 10
Insulation class	--	class1/class2
Dust/waterresistance	--	IP 66
LED current	--	see table 1
LED type	--	NICHIA
LED efficiency	L/W	150 Ts=25°C
LED circuits	--	NO parallel circuits
LED protection	--	NTC on LED boards
Ambient temperature	ºC	-40ºC/ +50ºC
Color temperature	K	4600 (standard)
All wires		LSZH (low smoke zero halogen)





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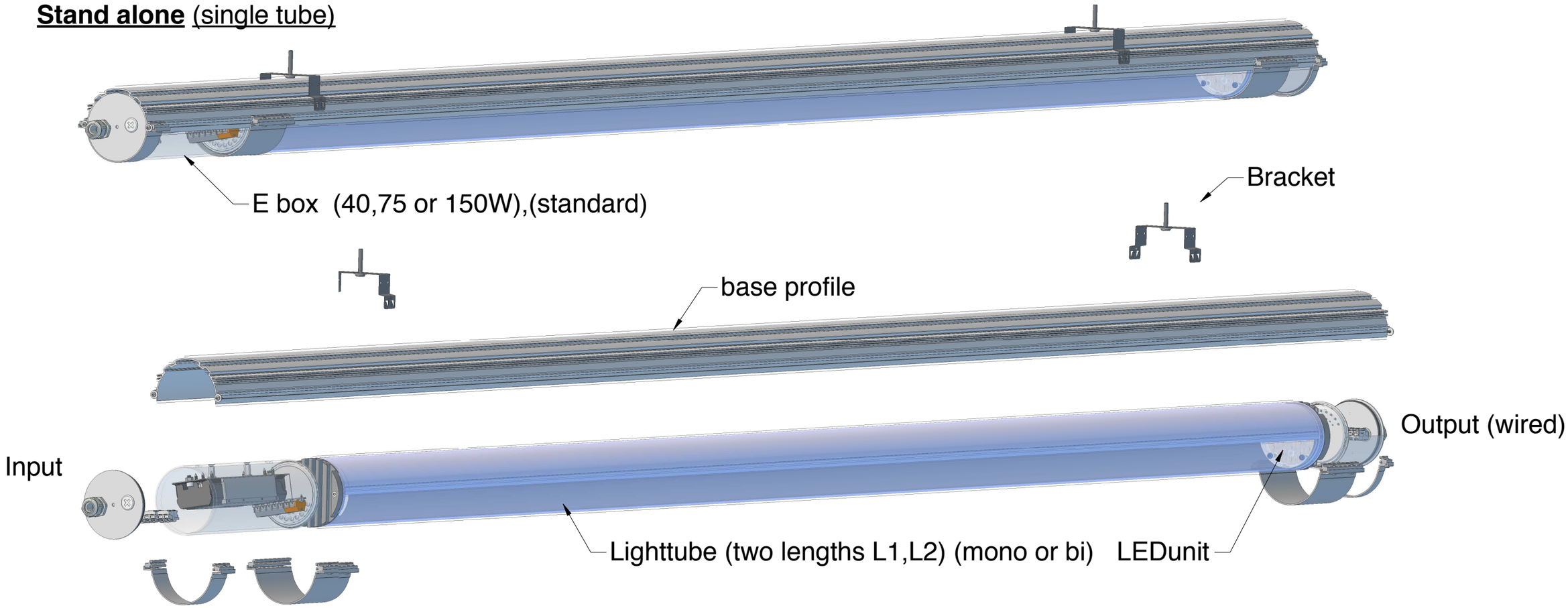
2.0 Lay out LEDlightpipe EVO

The LEDlightpipe EVO is a modular lighting sytem, suitable for continous light lines or stand alone luminairs.
The luminairs for the light lines are equipped with a plug&play (3 phase) connector system for a fast and secure installation.
The luminairs for stand alone are equipped with standard terminal blocks.
All LEDlightpipe EVO can be wired through to the other end, so-called wired versions.
The last LEDlightpipe in a line does not contain wires, so-called end versions.
The lighttube comes with two different lengths, L1 and L2 and can contain either one (mono) or two (bi) LEDunits.
The luminous flux varies from 3000 to 12.500 lumens using 40, 75 150 Watt DALI controlled LEDdrivers.
The possible configurations are explained in chapter 10.0.

Stand alone (single tube)



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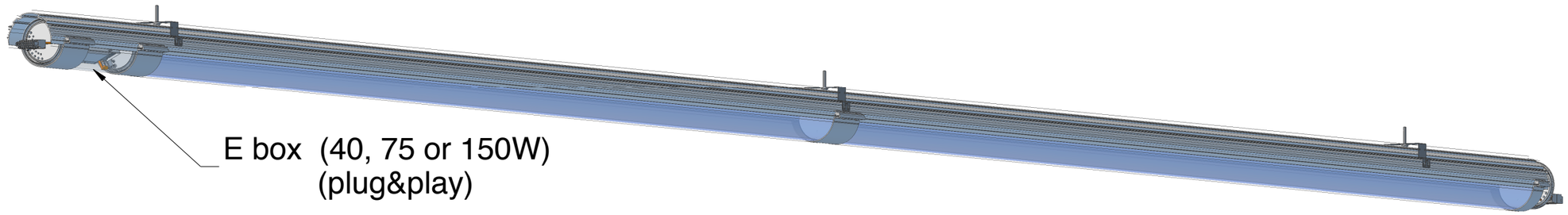
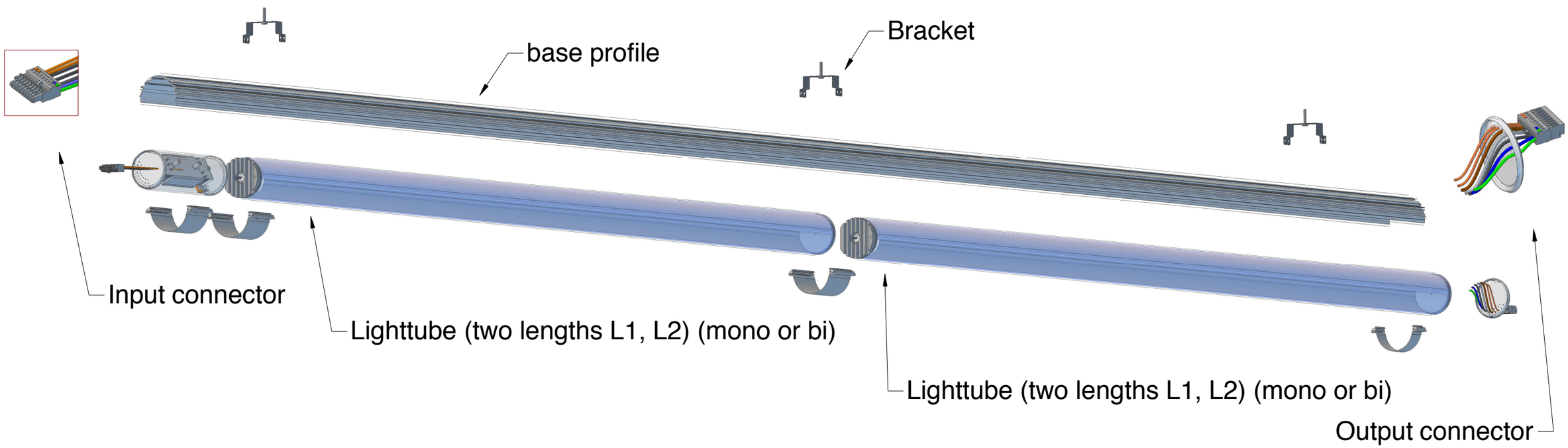
2.0 Lay out LEDlightpipe EVO

Line system (multiple tube)





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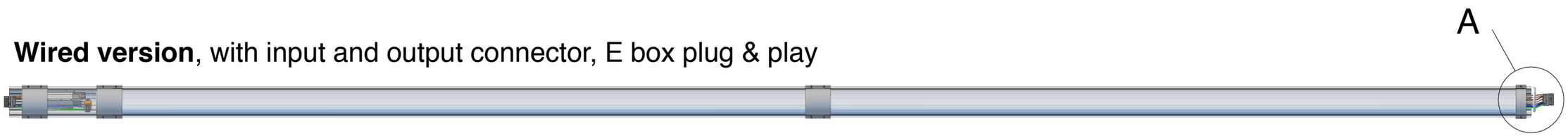
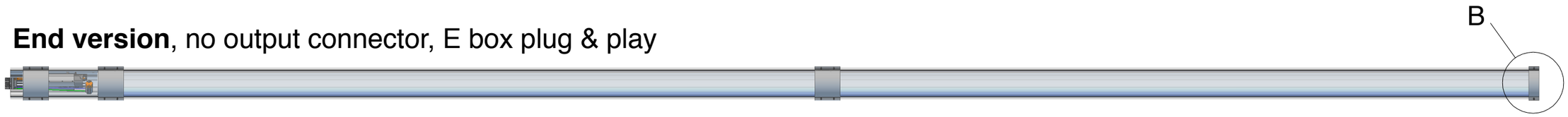
Line system (multiple tubes**),** for making continous lines of light

Wired version, with input and output connector, E box plug & play

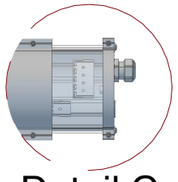


End version, no output connector, E box plug & play



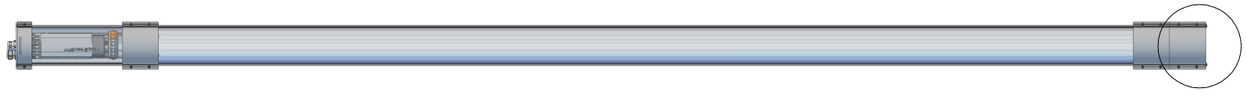
Stand alone (single tubes), for mounting idividual fixtures, E box standard

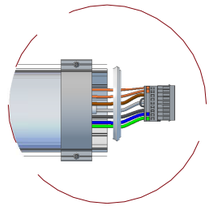
Wired version, with end terminal, E box standard



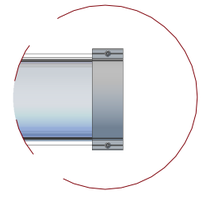
Detail C

End version, no end terminal





Detail A



Detail B

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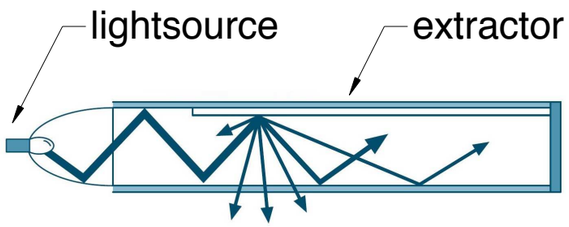
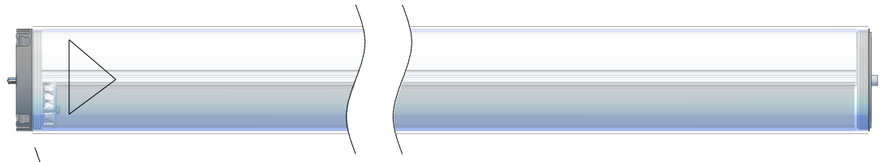
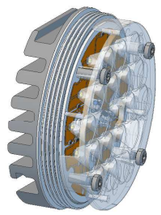
4.0 Lighttubes configurations



Lighttube working principle,
transportation and extraction of the light
to achieve an uniform and glarefree
lightdistribution

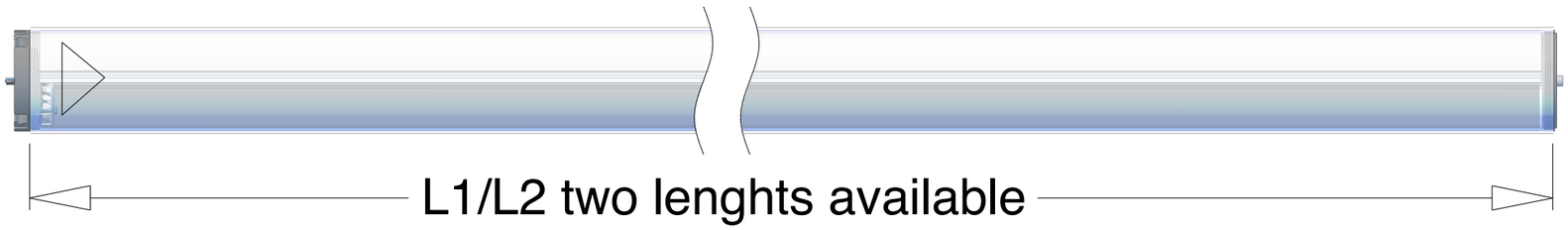


LEDlightpipe lighttube containing optical foils

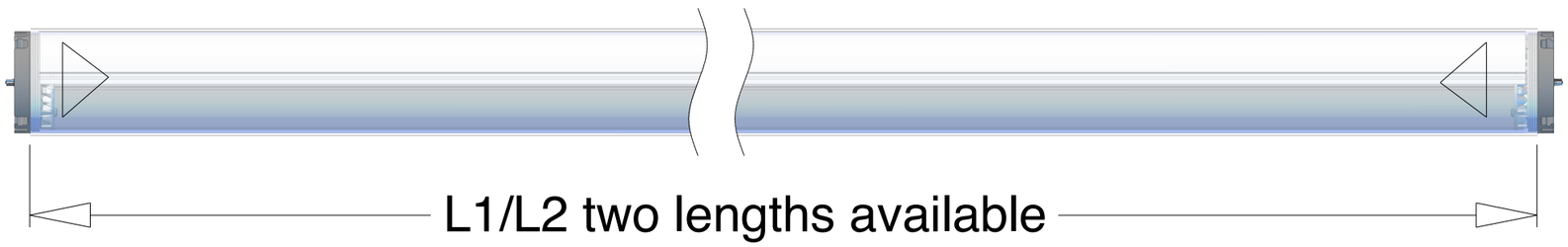


LEDunit containing,
- up to 18 NICHIA ceramic power LED's
- a NTC resistor for thermal protection
- all mounted on a metall core pcb
- rigid aluminum heat sink to conduct the heat
  to the aluminum profiles
- a lens to beam the light into the tube
- a rigid seal (no rubber) to seal the tube IP66
- a device to aerate the tube

mono lighttube, one side a LEDunit



bi lighttube, on both sides a LEDunit



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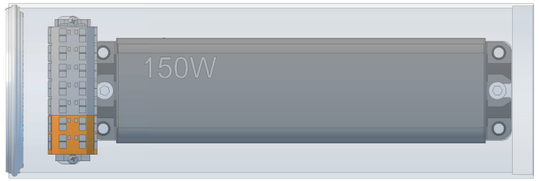
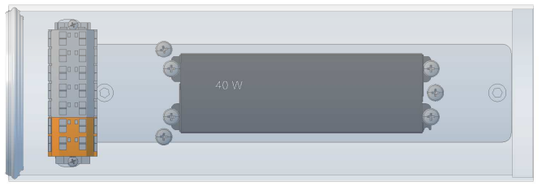
5.0 Driver-configurations and specifications

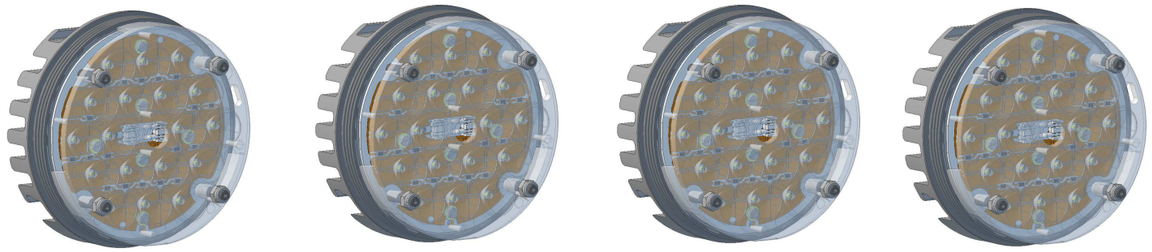


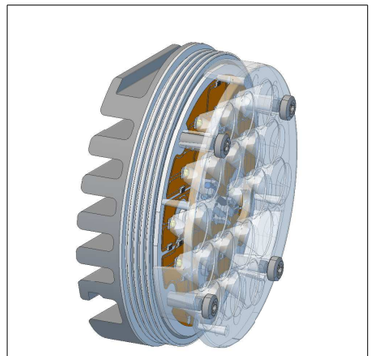
150 W driver to drive 4 LEDunits

75 W driver to drive 2 LEDunits



40 W driver to drive 1 LEDunit





LEDunit

Product specifications

Type Programmable	Output current range (mA)	Output voltage range (V)	Out-put power (W)	Type of dimming	Dimming range (%)	Module Tempera-ture Protection	Efficien-cy range, max load (%)	Input voltage range (Vac)	Inrush current peak (A)	Inrush current width to 50% (µs)	Power factor, 100% load	Power factor, dimmed 50%	Tc life (°C)	Lifetime @Tc life, 90% survivals[1] (hrs)
Xitanium 40W 0.7A Prog+ GL-J sXt	100-700	29-57	15-40	1-10 V/AmpDim/ DALI/Dynadimmer	100-10	yes	≥ 88	120-277	65	100	≥ 0.97	≥ 0.93	74	100,000
Xitanium 75W 0.35-0.7A GL Prog sXt	350-700	80-152	30-75	1-10 V/DALI/ Dynadimmer	100-10	yes	≥ 92	120-277	108	140	≥ 0.97	≥ 0.92	71	100,000
Xitanium 150W 0.35-0.7A GL Prog sXt	350-700	125-280	30-150	1-10 V/DALI/ Dynadimmer	100-10	yes	≥ 93	120-277	108	140	≥ 0.97	≥ 0.94	71	100,000

General product characteristics

Rated frequency	: 50/60 Hz	T max	: +80°C	Isolation class	: Class II
T ambient	: -40 to +55°C	THD	: 20%		

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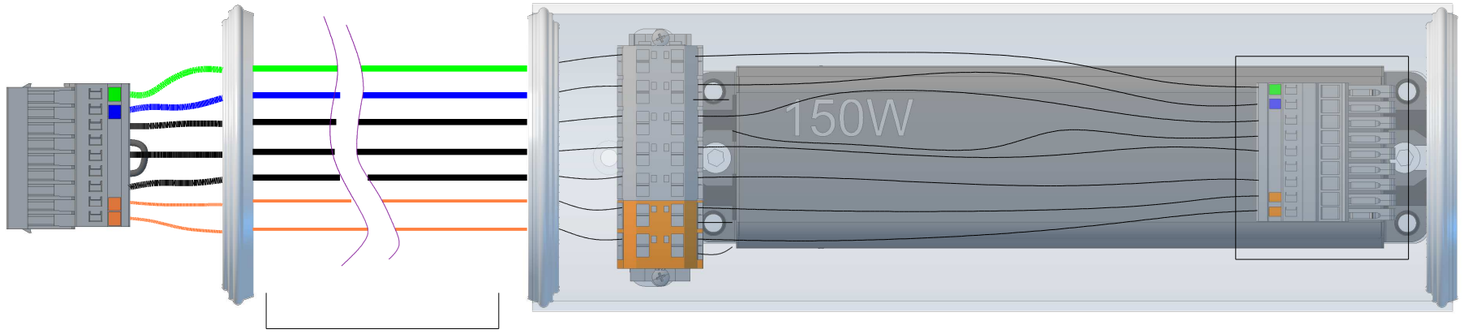
6.0 E box plug&play (multiple tubes)

The EVO multiple tubes series are designed to make continous light lines. For that reason plug&play connectivity for quick and failure free installation has been implemented.



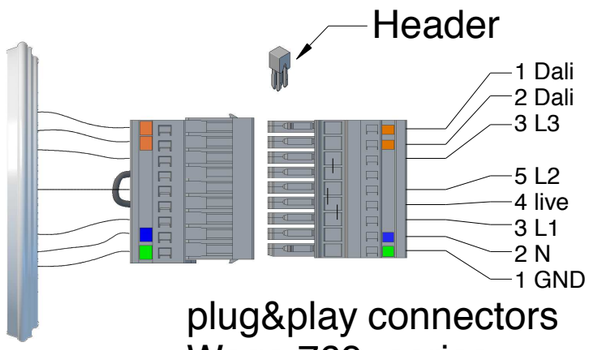
output connector **internal wiring**
3 phase+dali

E Box (wired) **input connector**
LEDdriver standard to L1

150 W
plug&play

75 W
plug&play

Symbols



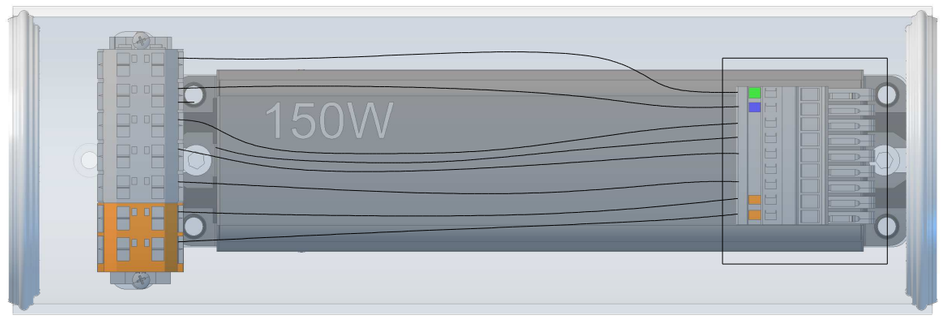
plug&play connectors
Wago 769- series

Phase selecting with header

live to L1

live to L2

live to L3



E Box (end) **input connector**
LEDdriver standard to L1

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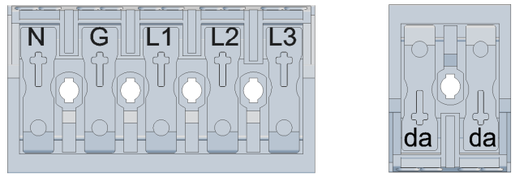
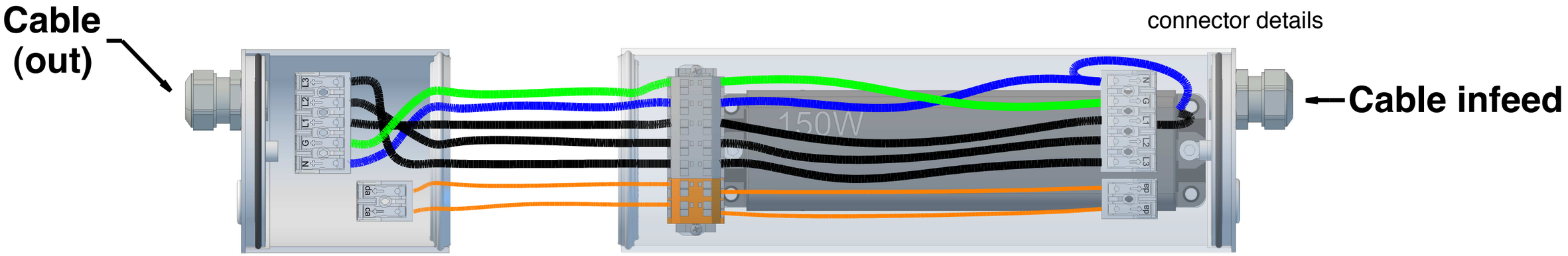
7.0 E box standard (single tubes)

All infeed connection have to be made by the installer. Once the E box is opened the two terminal strips can be pulled out to make the connections. The positons of the wires are shown on the connector.
The internal wiring to the other end is optional.



connector details



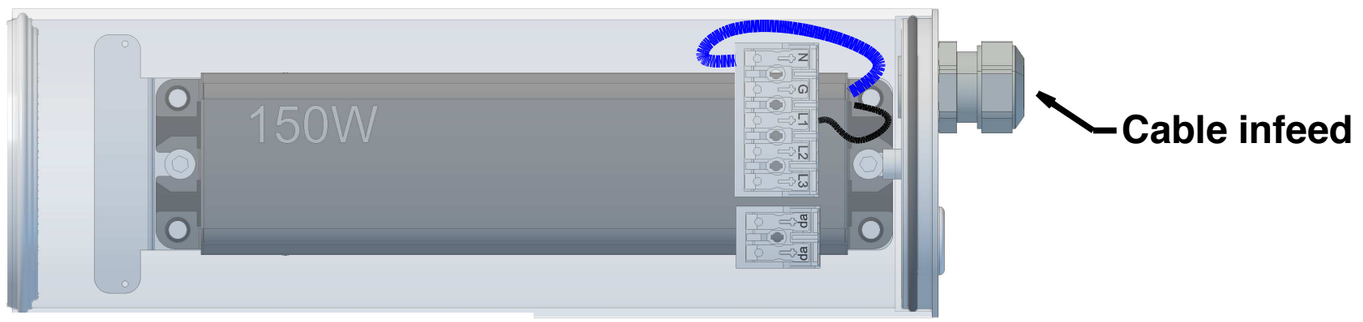
terminal strips

internal wiring
3 phase+dali

E Box (wired)

terminal strips
LEDdriver standard to L1
Wago 294-series

Symbols



E Box (end)

terminal strips
LEDdriver standard to L1
Wago 294-series

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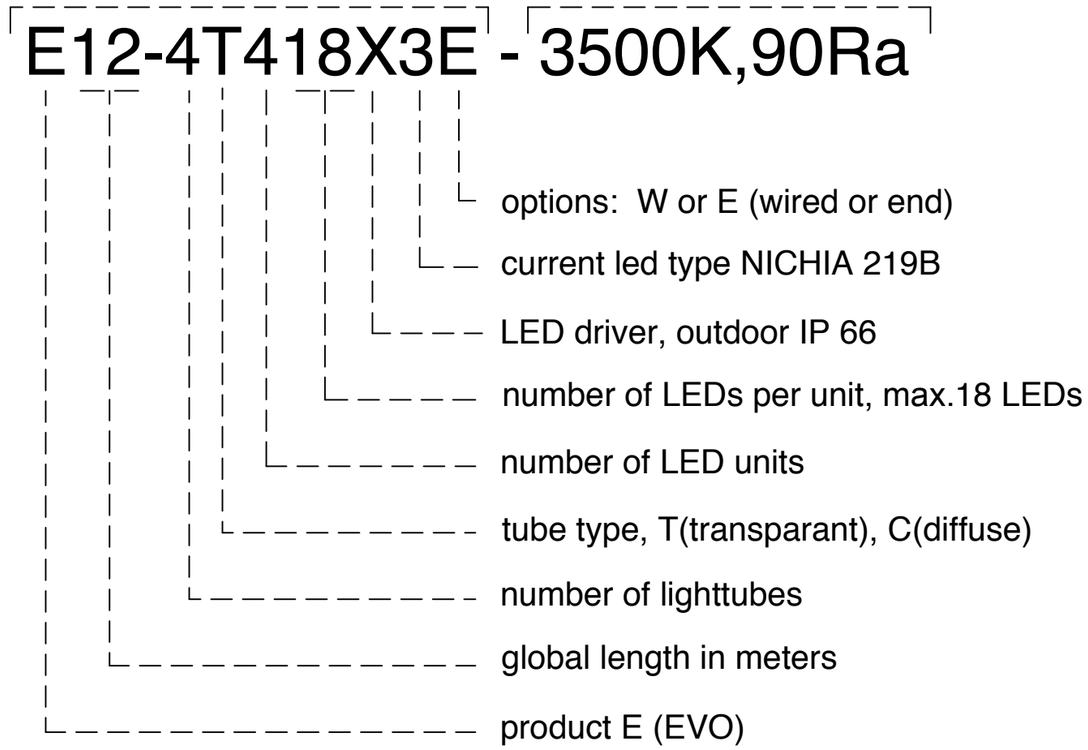
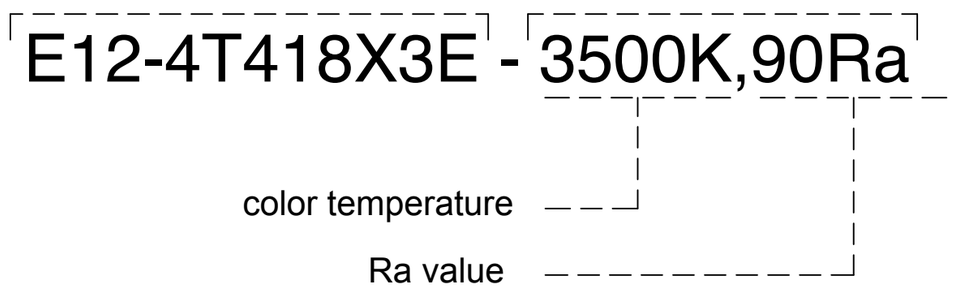
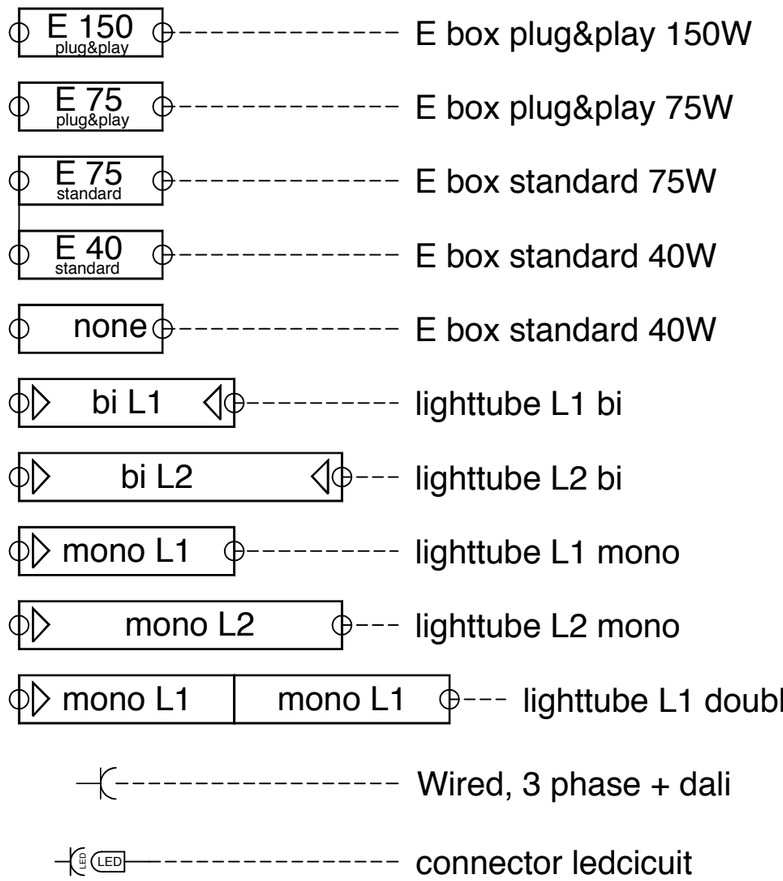

E12-4T418X3E - 3500K,90Ra
options: W or E (wired or end)
current led type NICHIA 219B
LED driver, outdoor IP 66
number of LEDs per unit, max.18 LEDs
number of LED units
tube type, T(transparant), C(diffuse)
number of lighttubes
global length in meters
product E (EVO)





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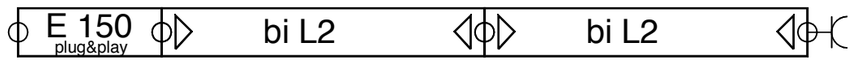
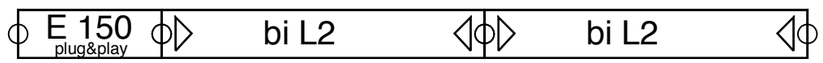
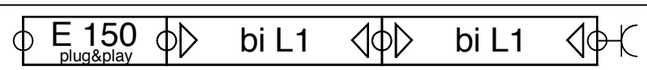
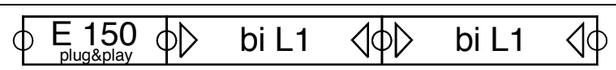
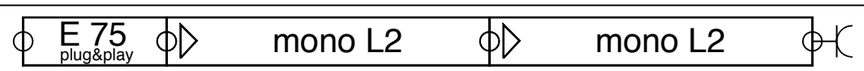
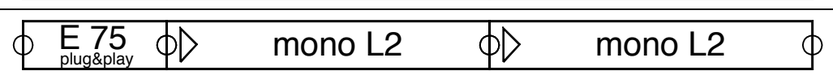
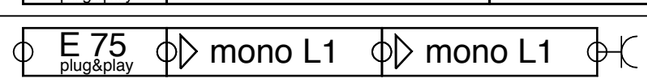
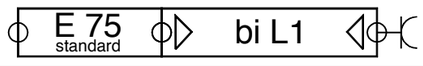
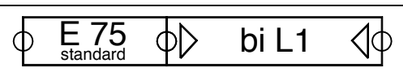
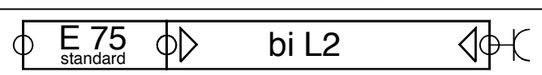
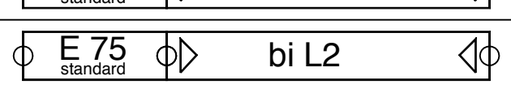
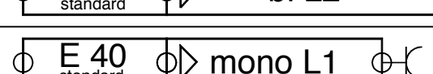
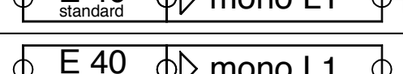
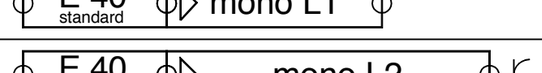
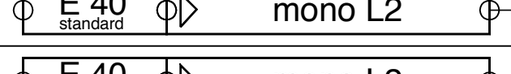
10.0 EVO delivery program

Based on the modularity of the LEDlightpipe EVO the following luminairs are available.

	product number	product description	product symbol	Length meter	Length foot	Power Watt	Luminous flux Lumen	Weigth Kg	pound
double tube (lines)	E6-2C418X3W -	EVO wired 6M bi		6	19.685'	162	12486	16	35.3
	E6-2C418X3E -	EVO end 6M bi		6	19.685'	162	12486	16	35.3
	E4-2C418X3W -	EVO wired 4M bi		4	13.123'	162	12486	15	33.1
	E4-2C418X3E -	EVO end 4M bi		4	13.123'	162	12486	15	33.1
	E6-2C218X3W -	EVO wired 6M mono		6	19.685'	81	6242	14	30.8
	E6-2C218X3E -	EVO end 6M mono		6	19.685'	81	6242	14	30.8
	E4-2C218X3W -	EVO wired 4M mono		4	13.123'	81	6242	13	28.7
	E4-2C218X3E -	EVO end 4M mono		4	13.123'	81	6242	13	28.7
single tube (stand alone)	E2.2-1C218X3W -	EVO wired 2.2M bi		2.2	7.218'	81	6242	11	24.3
	E2.2-1C218X3E -	EVO end 2.2M bi		2.2	7.218'	81	6242	11	24.3
	E3.2-1C218X3W -	EVO wired 3.2M bi		3.2	10.499'	81	6242	11	24.3
	E3.2-1T218X3E -	EVO end 3.2M bi		3.2	10.499'	81	6242	11	24.3
	E2.2-1C118X3W -	EVO wired 2.2M mono		2.2	7.218'	41	3121	10	22,0
	E2.2-1C118X3E -	EVO end 2.2M mono		2.2	7.218'	41	3121	10	22,0
	E3.2-1C118X3W -	EVO wired 3.2M mono		3.2	10.499'	41	3121	10	22,0
	E3.2-1C118X3E -	EVO end 3.2M mono		3.2	10.499'	41	3121	10	22,0

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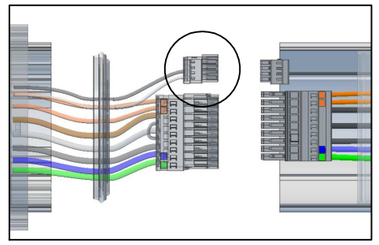
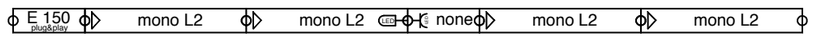
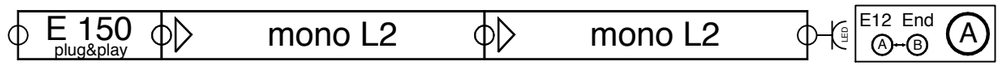
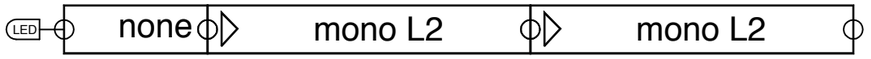
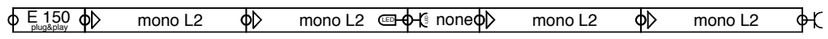
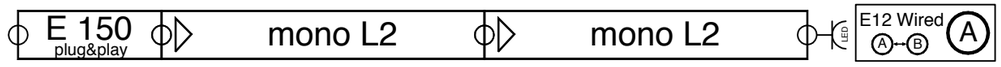
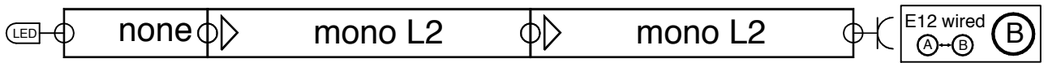
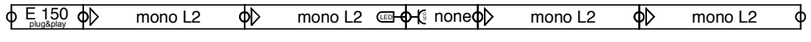
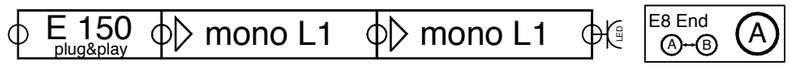
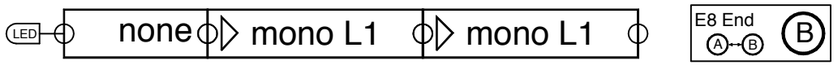
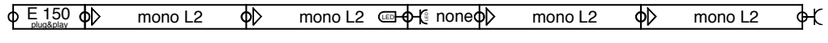
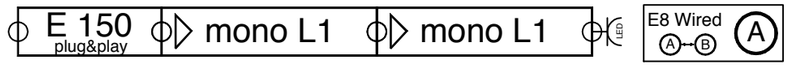
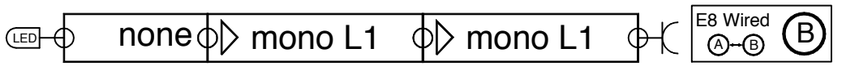
10.0 EVO delivery program

Due to the modulairity of the EVO LEDlightpipe it possible to configure extreme long LEDlightpipes.
These LEDlightpipes consist of two seperate parts to be connected in the mounting process.
The LEDdriver is suited in the first part (A) and a connector for the internal LED circuit is added.
For indentification and correct mounting a green sticker is placed on the fixtures.

LED connector



product number	product description	part	product symbol	Length meter	Length foot	Power Watt	Luminous flux Lumen	Weight Kg	Weight Pound
E12-4C418X3E -	EVO end 12M mono	A+B		12	39.37'	162	12486	28	61.7
		A							
		B							
E12-4C418X3W -	EVO Wired 12M mono	A+B		12	39.37'	162	12486	28	61.7
		A							
		B							
E8-4C418X3E -	EVO end 8M mono	A+B		8	26.25'	162	12486	26	57.3
		A							
		B							
E8-4C418X3W -	EVO Wired 8M mono	A+B		8	26.25'	162	12486	26	57.3
		A							
		B							

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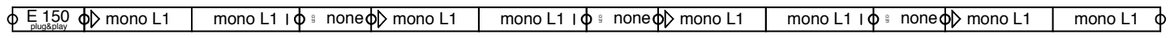
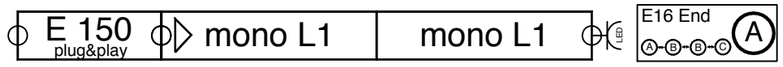
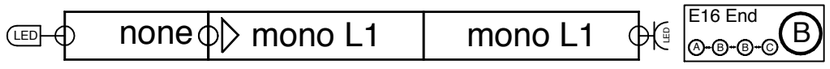
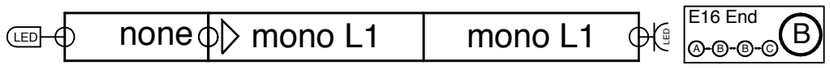
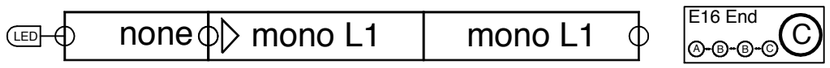
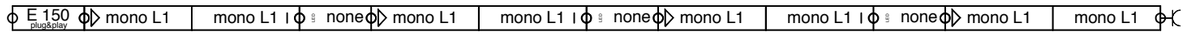
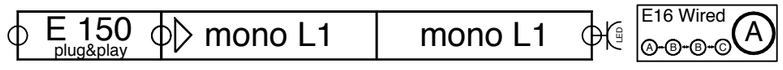
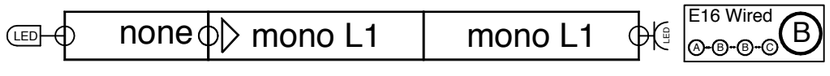
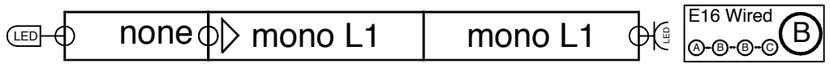
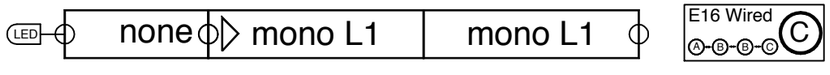
It is possible to optically combine two L1 tubes containing one LEDunit. In combination with the 150W plug&play e-box a luminaire with a total length of 16 meter can be made. This type consists of 4 individul parts to be combined during installation.
A typical application is a continous line over the trunk of the cars in a parking house to meet the EN 12464-1 norm.

product number	product description	part	product symbol	Length meter	Length foot	Power Watt	Luminous flux Lumen	Weigth Kg	Weigth pounds
E16-8C418X3E -	EVO end 16M mono			16	52.49'	162	12486	50	110.0
		A+2xB+C							
		A							
		B							
		B							
		C							

E16-8C418X3W -	EVO wired 16M mono			16	52.49'	162	12486	50	110,0
		A+2xB+C							
		A							
		B							
		B							
		C							

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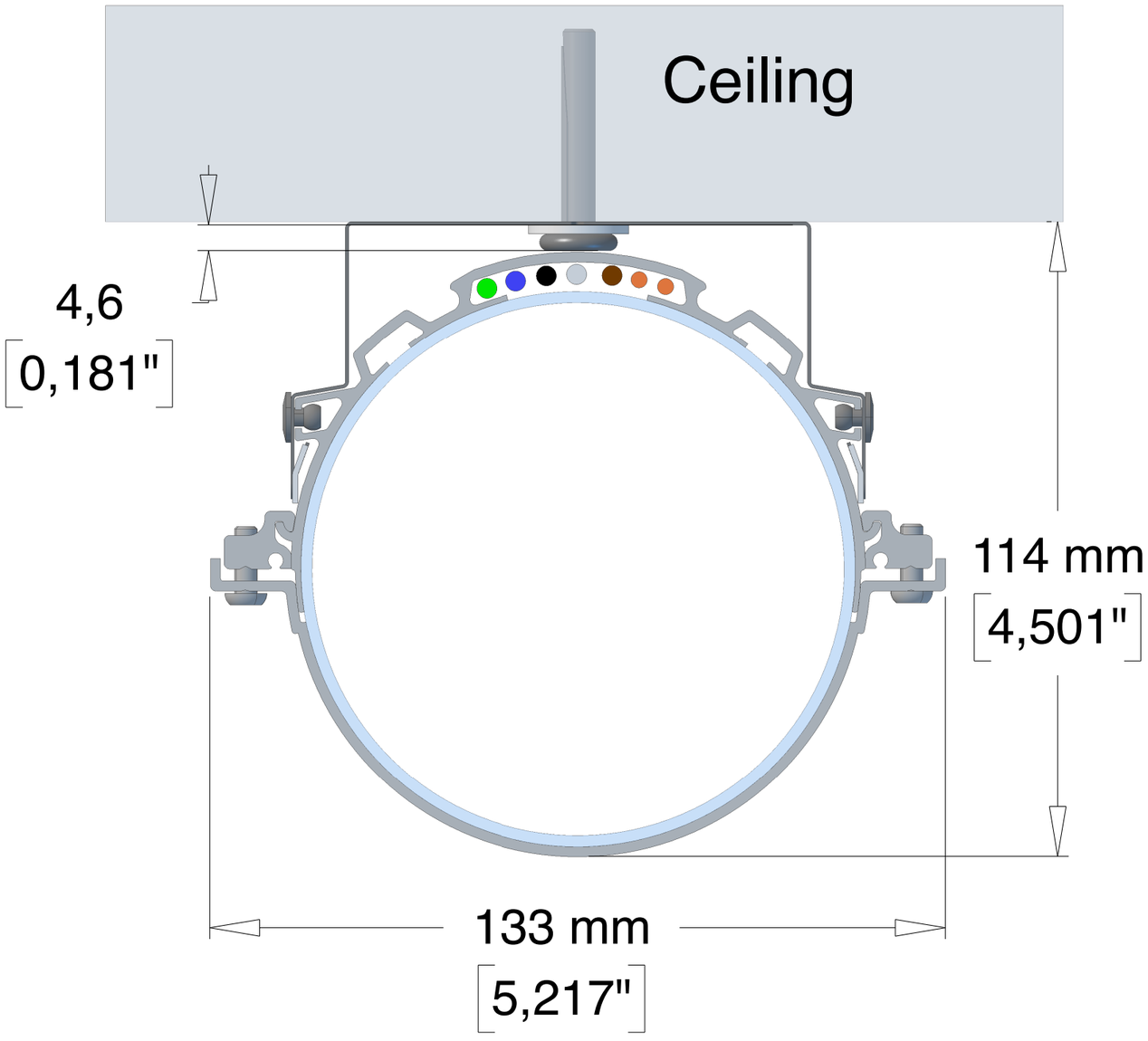
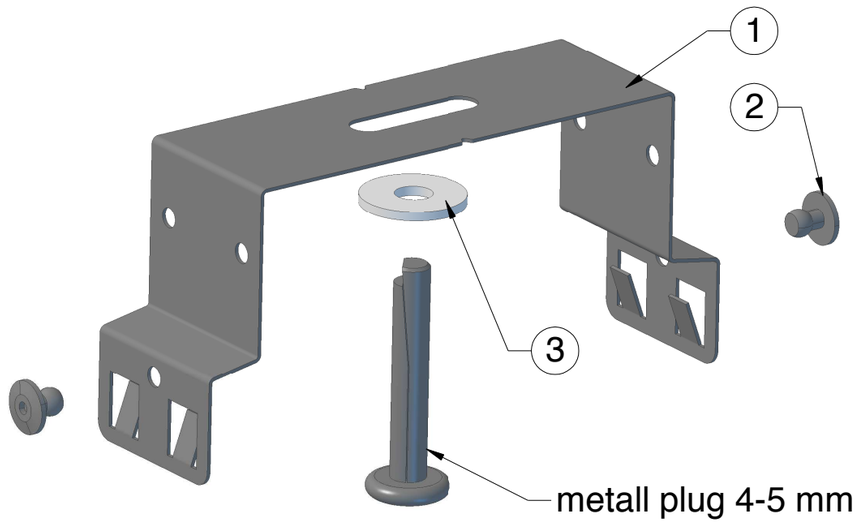
11.0 Mounting the EVO LEDlightpipe





number	art.code	name
1	2977	mountbracket
2	6303315	pop rivet
3	M6 (d=3D)	washer

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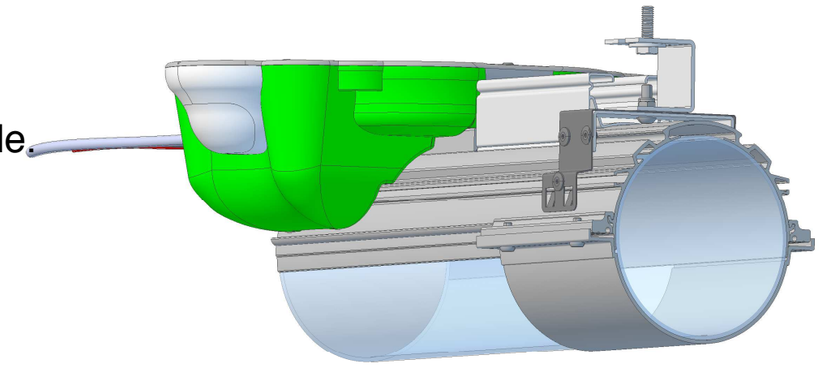
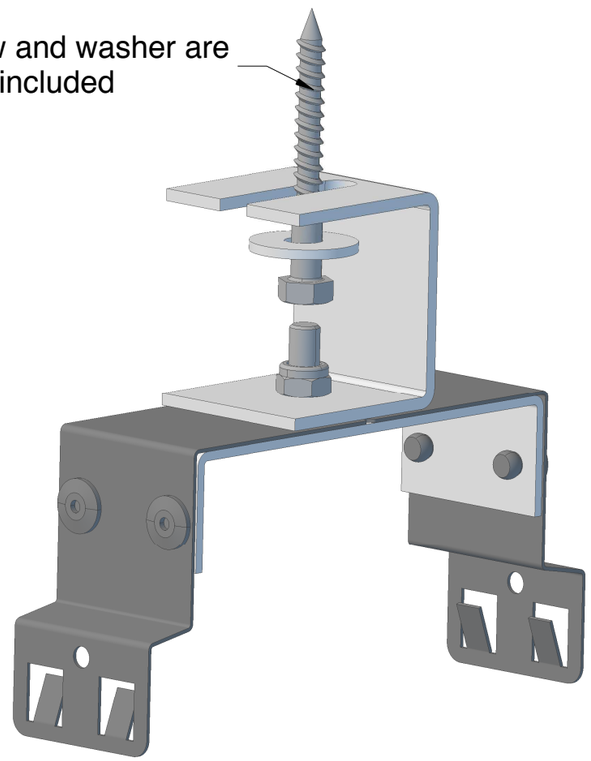
12.0 Park Assist module

In order to be able to mount the parkassist module or just the cable channel
it is necessary to create more room between the ceiling and the LEDlightpipe.
For this reason a special lowering kit to replace the standard bracket is available.

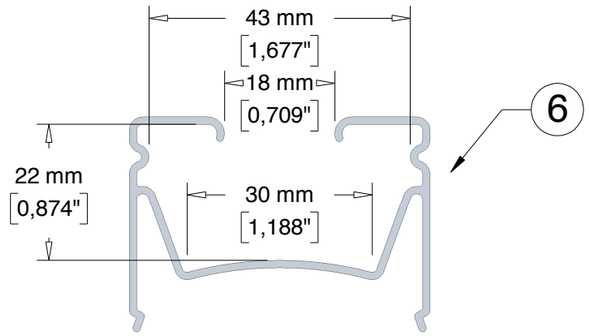


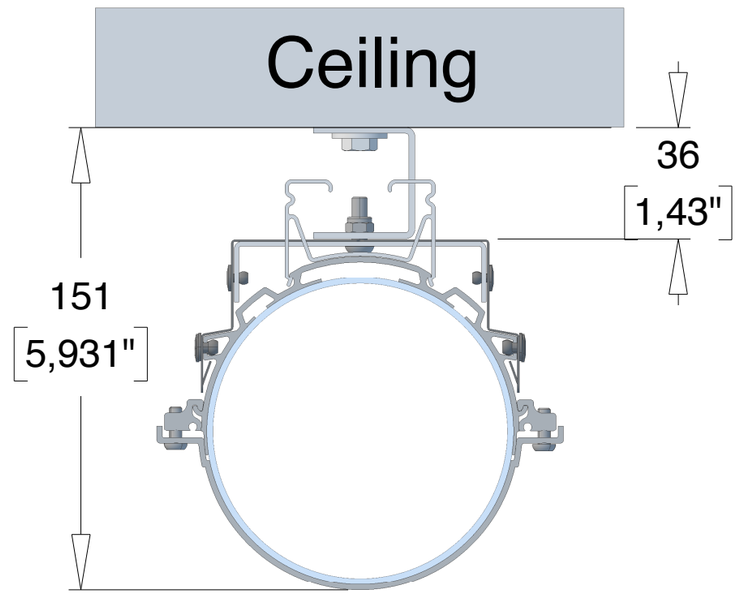
bracket lowering set
art.code:3490

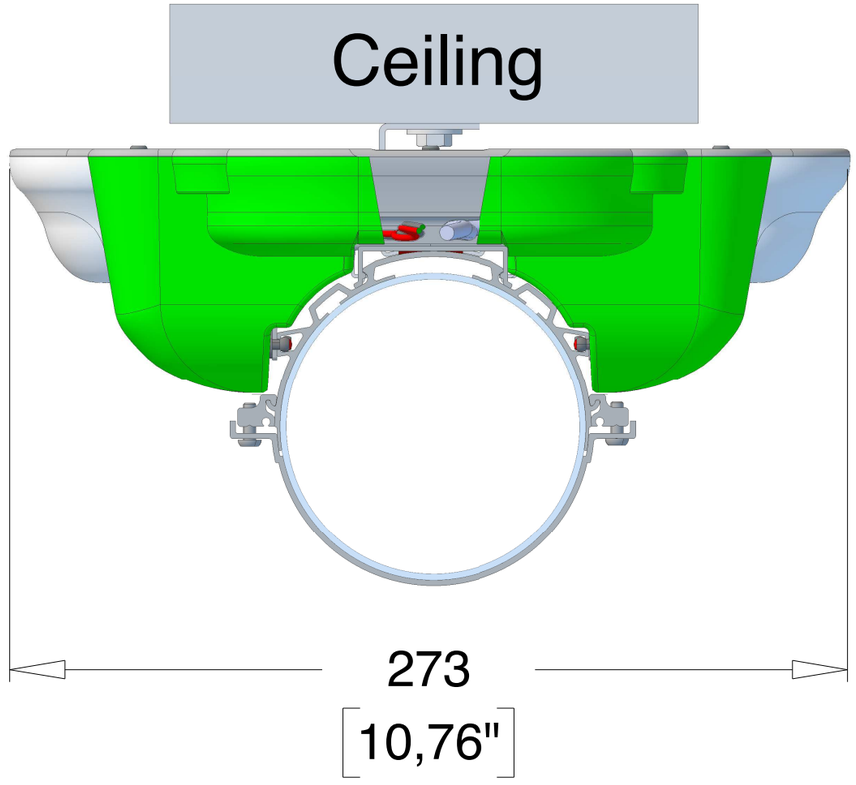
screw and washer are
NOT included



cable channel section
art.code 3374







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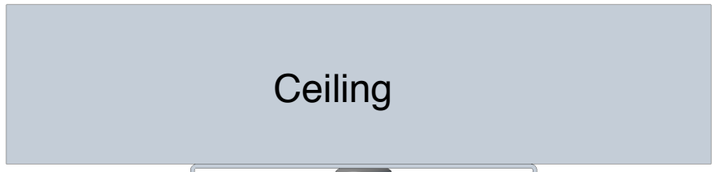
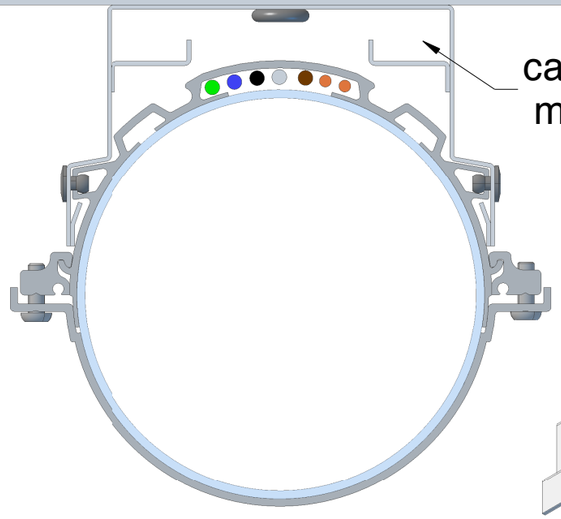
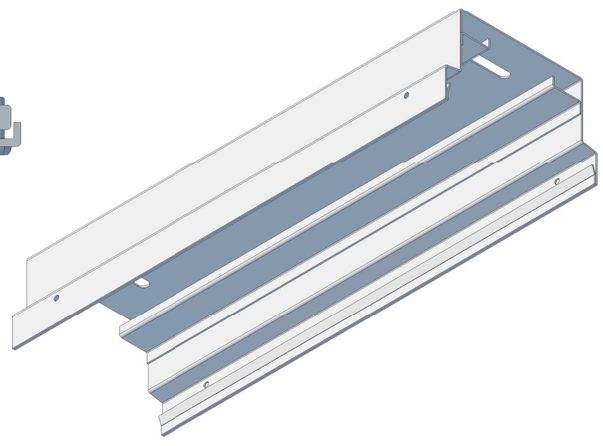
13.0 Special mountings

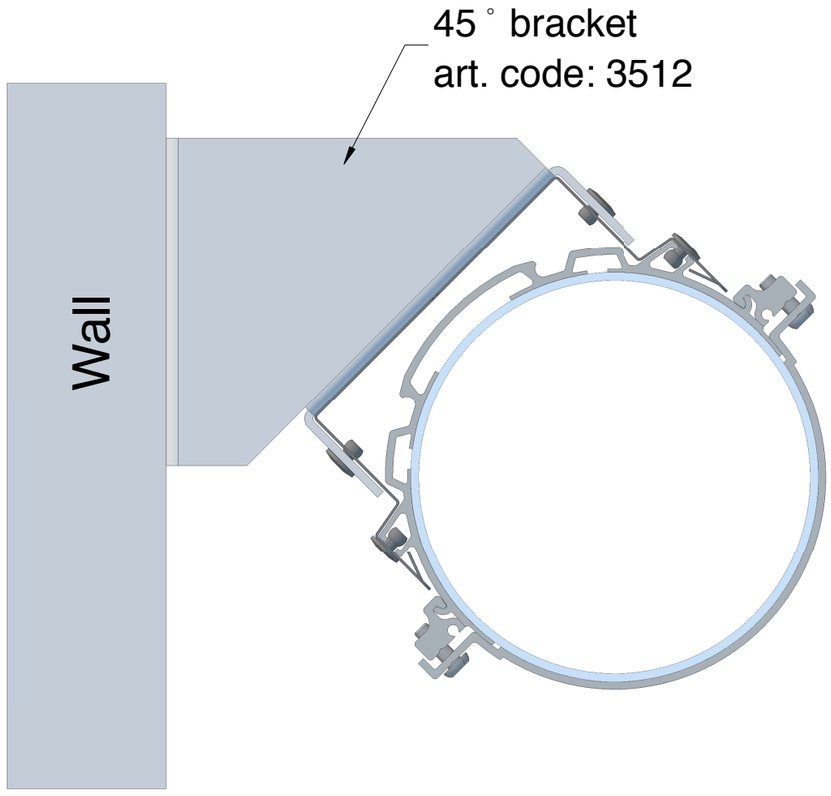
Instead of using the standard mounting bracket on a certain distance it is also possible to use a (custom) profile on top of the EVO base aluminum profile over the entire length of the luminaire.
The profile shown below is an example profile and contains two channels for optional cabling.
The material of the profile can be either anodized aluminum or stainless steel.
The profile is also closing the room between the LEDlightpipe and the ceiling.
It is also possible to mount the LEDlightpipe at an angle of 45 degree's against the wall.







Ceiling profile (stainless steel)



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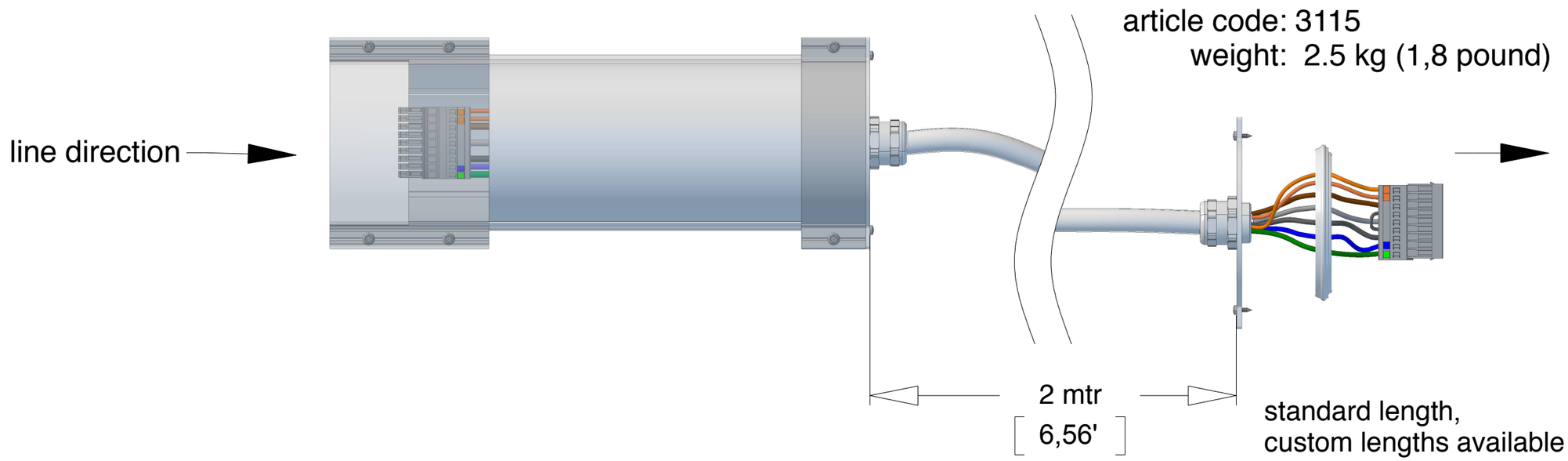
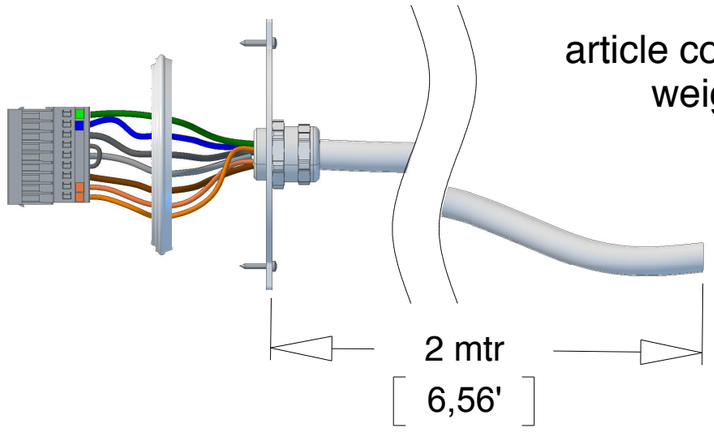
Connection cable (line system), to pass obstackels like beams or to make a bend in the line



Start cable (line system), to feed in the LEDlightpipe



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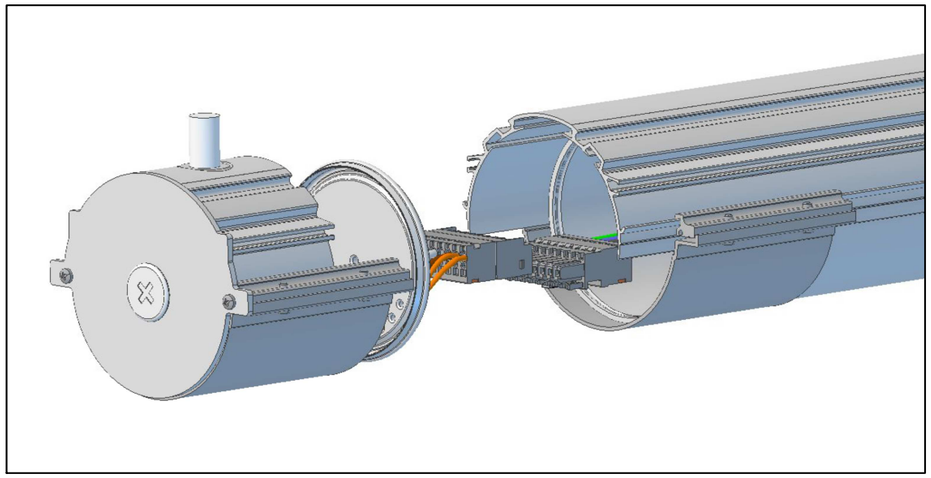
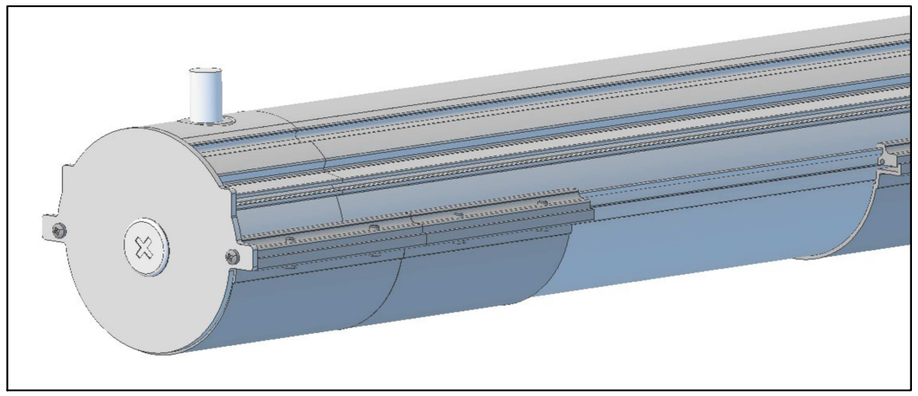
***Top infeed (line system*),** to feed in the first LEDlightpipe from the topside.

article code: 3114

The standard length of the cable is 2 meters. (6,56')





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15.0 Mounting and connecting a line

Mounting the start cable

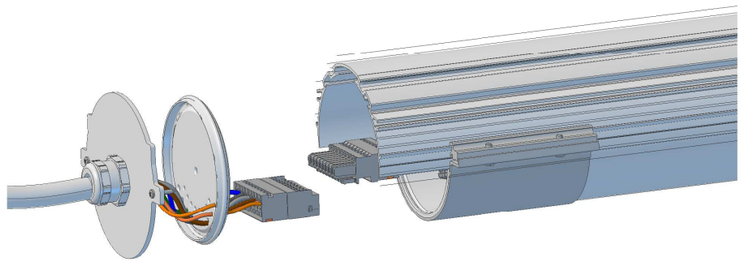

fig 1

1. select the correct phase (standard L1)
2. plug in the connector

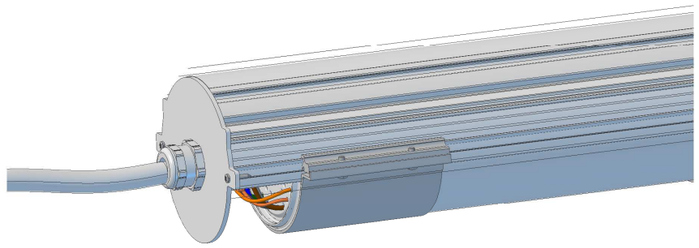

fig 2

1. put the connectors inside the E box
2. click the white closing disc in the housing

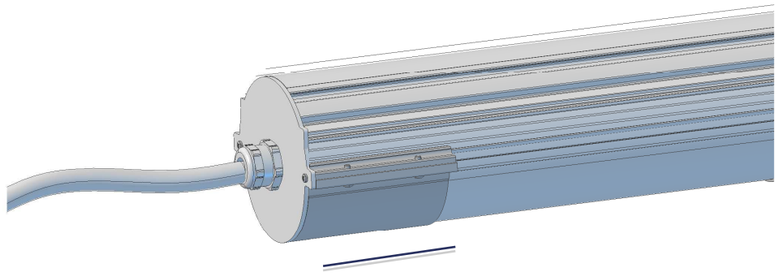

fig 3

1. loosen the clamp screws and slide the clamp to the end
2. mount the screws to lock the front plate
3. tighten the clamp screws

Mounting plug&play LEDlightpipes

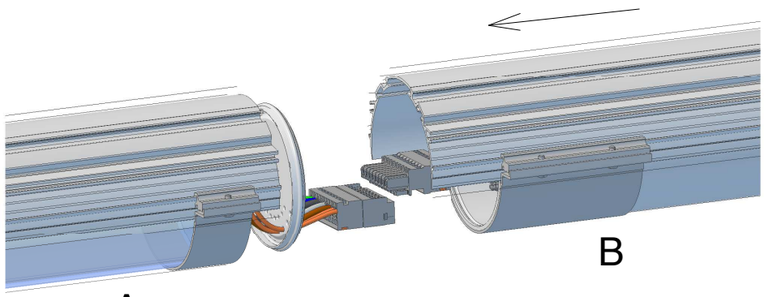

fig 4

1. lightpipe A is fixed, lightpipe B is hooked in and can be moved in the arrow direction
2. select the correct phase for lightpipe B
3. plug in the connectors and click in the disc

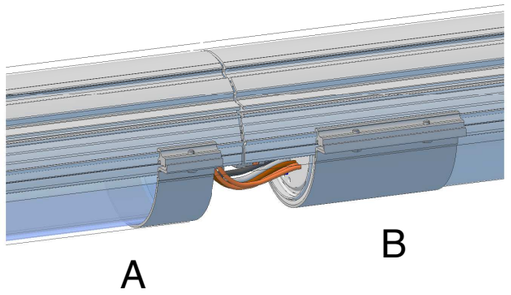

fig 5

1. move lightpipe B towards A until a gap of approximately 5 mm remains
2. fix and secure the lightpipe by mounting the rivets

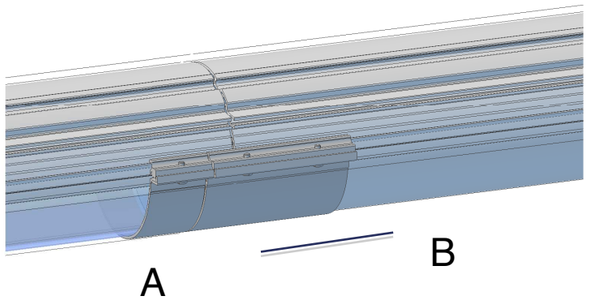

fig 6

1. loosen the clamp screws and slide the clamp towards lightpipe A
2. tighten the clamp screws

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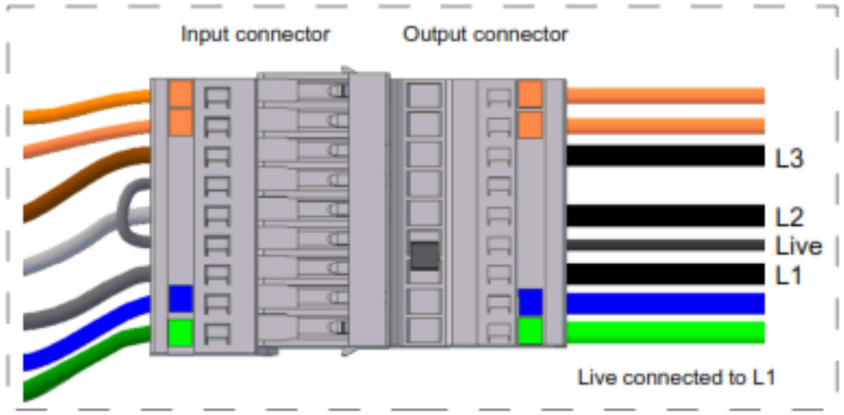
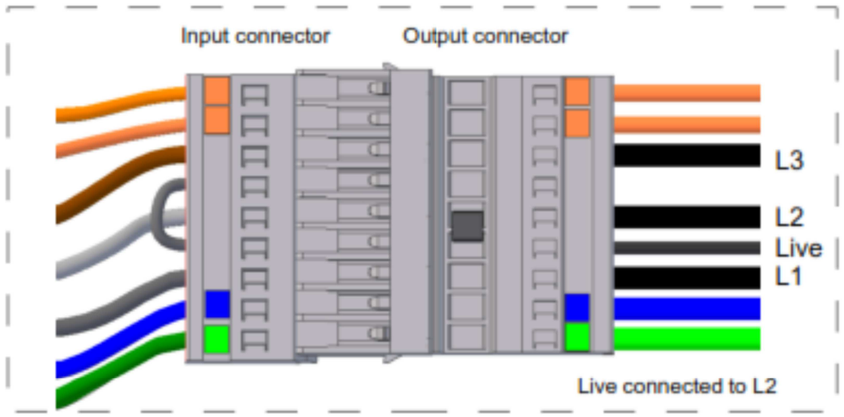
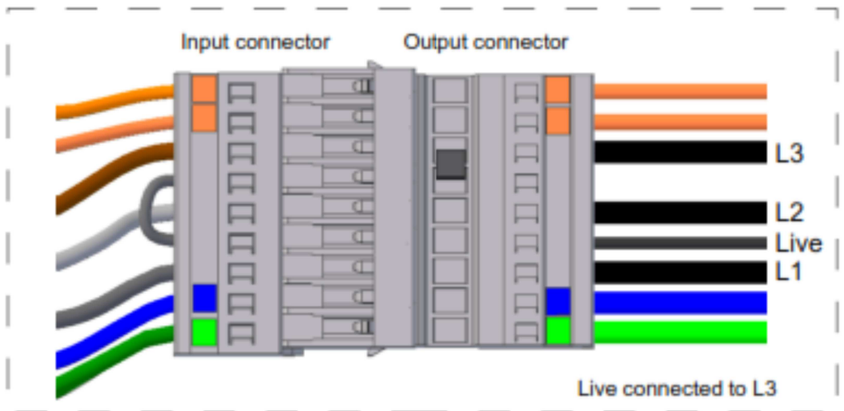
16.0 Phase selection

Fase selector

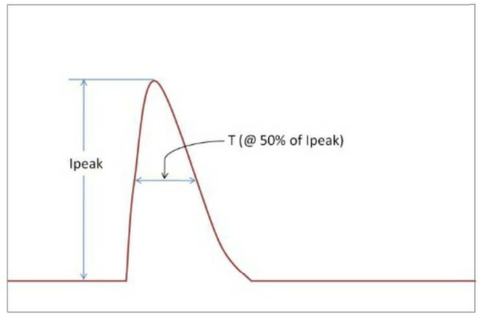






17.0 Inrush current

Inrush Current Info:



Vin	Ipeak	T (@ 50% of Ipeak)
120 Vrms	58 A	140 µs
230 Vrms	108 A	140 µs
277 Vrms	126 A	140 µs
305 Vrms	142 A	140 µs

Note: Equation Valid for T<1mS					Mini ABB	MCB - B Type				MCB - C Type				Fuse Types gG and gL			
		Pin(max)(W)	Imax (A)	T(mS)	K	10A	16A	20A	25A	10A	16A	20A	25A	10A	16A	20A	25A
929000702202	Xitanium 150W 0.35-0.7A GL Prog sXt	167	130	0.140	19.4	4	7	9	11	7	12	15	19	10	15	19	24
929000702302	Xitanium 75W 0.35-0.7A GL Prog sXt	83	130	0.140	19.4	4	7	9	11	7	12	15	19	19	31	38	48

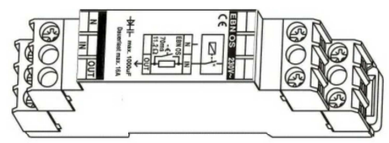
The use of an inrush current limiter can increase the amount of drivers connected to the MCB.

20 pieces per MCB (3kW/MCB) is a safe quantity.

Examples off inrush current limiters:

Inrush current limiter EBN-OS

For POWERTRONIC ECGs



POWERTRONIC ECGs in combination with EBN-OS

POWERTRONIC ECGs come with an electronic power factor correction (PFC), which causes a high inrush current. If several PT ECGs are switched on at the same time, the inrush current can be so high that the automatic circuit breaker will trigger. Therefore, the number of ECGs per automatic circuit breaker is limited.

The inrush current limiter allows to connect more ECGs to one automatic circuit breaker.

http://www.osram.nl/osram_bx/NL/Professioneel645693/E-VSA/ECGs_for_HID/EBN-OS/index.html

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Short Specification:

- 16A, 23A, 33A peak limiting available
- AC-Line Input 184...265Vac, 16A cont.
- DIN-Rail 35mm standard
- Wall mounting standard
- Screw terminals 26..10AWG
- Integrated bypass relay
- Inrush current limitation time 300/500ms
- Capacitive Load 1500uF...4000uF
- Integrated temperature fuse
- IP20 UL94V-0 housing DIN43880 for DIN/VDE0603 switch cabinets

http://www.camtec-gmbh.com/files/ESB101_E.pdf

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18.0 do's and dont's

Always disconnect power while making the electrical connections.

Always work with two persons to hook in the LED lightpipe's

All lightpipe's are covered with a protective foil, remove it after mounting has been completed.

The distance between mountbrackets must never exceed 3 meters.

The ledlightpipe can be turned off by DALI, be aware that main power still remains on the lightpipe.

Always mount rivets into the mountbrackets.

Don't make a connection between Phase and Common or between common and ground with the phase selector.

The ledlightpipes are to be connected to the oficial elektricity network.Warranty will be lost when connecting to any other local network due to possible degradation of power quality.

All BB-Lightconcepts general delivery conditions are aplicable.

CERTIFICATE

Issued to:
Applicant:
BB Lightconcepts B.V.
Fabriekstraat 16-04
7005 AR Doetinchem, The Netherlands

Manufacturer/Licensee:
BB Lightconcepts B.V.
Fabriekstraat 16-04
7005 AR Doetinchem, The Netherlands

Product : LED lightpipe
Trade name : BB LIGHTCONCEPTS
Types : EVO SERIES

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:
- a type test according to the standard EN 60598-1:2008; EN 60598-2-1:1989; EN 62031:2008; EN 62471:2008
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 2148929

DEKRA hereby grants the right to use the ENEC KEMA-KEUR certification mark.

The ENEC KEMA-KEUR certification mark may be applied to the product as specified in this certificate for the duration of the ENEC KEMA-KEUR certification agreement and under the conditions of the ENEC KEMA-KEUR certification agreement.

This certificate is issued on: 24 October 2013 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 2165520.01

DEKRA Certification B.V.

drs. G.J. Zoetbrood
Managing Director

H.J. Brouwer
Certification Manager

© Integral publication of this certificate is allowed

ACCREDITED BY
THE DUTCH COUNCIL
FOR ACCREDITATION

DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands

IEC IECEE CB SCHEME

Ref. Certif. No.
NL-28697

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEM CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	LED lightpipe
Name and address of the Applicant Nom et adresse du demandeur	BB Lightconcepts Fabriekstraat 16-04, 7005 AR Doetinchem The Netherlands
Name and address of the manufacturer Nom et adresse du fabricant	BB Lightconcepts Fabriekstraat 16-04, 7005 AR Doetinchem The Netherlands
Name and address of the factory Nom et adresse de l'usine	BB Lightconcepts Fabriekstraat 16-04, 7005 AR Doetinchem The Netherlands
Rating and principal characteristics aleurs nominales et caractéristiques principales	U input 120 - 270 V, 50/60 Hz, I LED (max) 700 mA, ta -40 °C ... +50 °C, IP66, IK10
Trademark (if any) Marque de fabrique (si elle existe)	BB Lightconcepts
Type of manufacturer's Testing Laboratories used Type de programme de laboratoire d'essais constructeur	
Model / Type Ref. Réf. de type	EVO series
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiquées sur la 2ème page)	
A sample of product was tested and found to be in conformity with IEC Un échantillon de ce produit a été essayé et été considéré conforme à la CEI	60598-1(ed.7) 60598-2-1(ed.1);am1 62031(ed.1)
As shown in the test report Ref. No. which forms part of this certificate Comme indiqué dans le rapport d'essais numéro de référence qui constitue partie de ce certificat	2165520.50/51

This CB Test Certificate is issued by the National Certification Body:

DEKRA Certification B.V.
Meander 1051, 6825 MJ
Arnhem
The Netherlands

Ce Certificat d'essai OC est établi par l'Organisme National de Certification

DEKRA

Date: 2013-10-23

Signature: H.J. Brouwer

page 1 of 1